

ASSIGNMENT 1

Textbook assignment: Chapter 1, "Amplifiers," pages 1-1 through 1-40. Chapter 2, "Video and RF Amplifiers," pages 2-1 through 2-34.

- 1-1. The control of an output signal by an input signal resulting in the output signal having some (or all) of the characteristics of the input signal is known by which of the following terms?
 1. Multiplication
 2. Magnification
 3. Amplification
 4. Addition
- 1-2. Which of the following statements describes the relationship of input and output signals in a amplifier?
 1. The input signal is actually changed into the output signal
 2. Both the input and output signal are unchanged; neither is affected by the other
 3. The input signal is controlled by the output signal and the output signal remains unchanged
 4. The input signal remains unchanged and the output signal is controlled by the input signal
- 1-3. Why are amplifiers used in electronic devices?
 1. To provide signals of usable amplitude
 2. To "pick up" broadcast signals
 3. To select the proper broadcast signal
 4. To change the broadcast signal to an audio signal
- 1-4. Most amplifiers can be classified in which of the following ways?
 1. Function and size
 2. Power requirements and size
 3. Function and frequency response
 4. Frequency response and power requirements
- 1-5. The speaker system of a record player should be driven by which of the following types of amplifier?
 1. An audio power amplifier
 2. A video voltage amplifier
 3. A direct-current voltage amplifier
 4. An alternating-current rf amplifier
- 1-6. The signal from a radio antenna should be amplified by which of the following types of amplifier?
 1. An rf voltage amplifier
 2. A video power amplifier
 3. A direct-current audio amplifier
 4. An alternating-current power amplifier
- 1-7. The class of operation of an amplifier is determined by which of the following factors?
 1. The gain of the stage
 2. The efficiency of the amplifier
 3. The amount of time (in relation to the input signal) that current flows in the output circuit
 4. The amount of current (in relation to the input-signal current) that flows in the output circuit

1-8. Which of the following is NOT a class of operation for an amplifier?

1. A
2. C
3. AB
4. AC

1-9. If the output of a circuit should be a representation of less than one-half of the input signal, what class of operation should be used?

1. A
2. C
3. AB
4. AC

1-10. What class of operation is the most efficient?

1. A
2. C
3. AB
4. AC

1-11. What class of operation has the highest fidelity?

1. A
2. C
3. AB
4. AC

1-12. What is the purpose of an amplifier-coupling network?

1. To "block" d.c.
2. To provide gain between stages
3. To separate one stage from another
4. To transfer energy from one stage to another

1-13. Which of the following is NOT a method of coupling amplifier stages?

1. RC
2. Resistor
3. Impedance
4. Transformer

1-14. What is the most common form of coupling?

1. RC
2. Resistor
3. Impedance
4. Transformer

1-15. Which of the following types of coupling is usually used to couple the output from a power amplifier?

1. RC
2. Resistor
3. Impedance
4. Transformer

1-16. Which of the following types of amplifiers have both high and low frequency response limitations?

1. RC
2. Resistor
3. Impedance
4. Transformer

1-17. Which of the following types of coupling is most effective at high frequencies?

1. RC
2. Resistor
3. Impedance
4. Direct

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1-18. For maximum power transfer between circuits, what impedance relationship should there be between the two circuits?

1. The output impedance of circuit number one should be higher
2. The input impedance of circuit number one should be higher than the output impedance of circuit number two
3. The output impedance of circuit number one should be lower than the input impedance of circuit number two
4. The output impedance of circuit number one should be equal to the input impedance of circuit number two

1-19. For maximum current at the input to a circuit, what should the relationship of the input impedance be to the output impedance of the previous stage?

1. Higher than
2. Lower than
3. Equal to
4. The impedance relationship is immaterial

1-20. What is the (a) input impedance and (b) output impedance of a common-base transistor configuration?

1. (a) Low (b) low
2. (a) Low (b) high
3. (a) High (b) low
4. (a) High (b) high

1-21. What transistor configuration should be used to match a high output impedance to a low input impedance?

1. Common collector
2. Common emitter
3. Common gate
4. Common base

1-22. What type of coupling is most useful for impedance matching?

1. RC
2. Resistor
3. Impedance
4. Transformer

1-23. What is feedback?

1. The control of a circuit output signal by the input signal
2. The control of a circuit input signal by the output signal
3. The coupling of a portion of the output signal to the input of the circuit
4. The coupling of a portion of the input signal to the output of the circuit

1-24. Which of the following terms describe the two types of feedback?

1. Positive and negative
2. Degenerative and regenerative
3. Both 1 and 2 above
4. Bypassed and unbypassed

1-25. What type of feedback provide an increased amplitude output signal?

1. Positive
2. Negative
3. Bypassed
4. Unbypassed

1-26. Distortion caused by amplifier saturation can be reduced by using which of the following types of feedback?

1. Positive
2. Negative
3. Regenerative
4. Unbypassed

1-27. What type feedback is provided if the feedback signal is out of phase with the input signal?

1. Unbypassed
2. Bypassed
3. Negative
4. Positive

1-28. What type of feedback is provided by a capacitor connected across the emitter-resistor in a common-emitter transistor amplifier?

1. Bypassed
2. Positive
3. Negative
4. Unbypassed

1-29. What are the (a) inputs and (b) outputs of a phase splitter?

1. (a) Two signals in phase
(b) One signal
2. (a) Two signals out of phase
(b) One signal
3. (a) One signal
(b) Two signals in phase
4. (a) One signal
(b) Two signals out of phase

1-30. A single-stage, two transistor amplifier that uses a phase splitter input is classified as what type of amplifier?

1. Inverse
2. Push-pull
3. Phase splitter
4. Regenerative

1-31. Which of the following is a common use for a push-pull amplifier?

1. The first stage of a video amplifier
2. The amplifier stage connected directly to an antenna
3. The second stage in a four stage rf amplifier
4. The final stage in an audio amplifier

1-32. What is the advantage of a push-pull amplifier as compared to a single transistor amplifier?

1. Lower cost
2. Fewer parts
3. Higher gain
4. Less power usage

1-33. To provide good fidelity output signals, which of the following classes of operation CANNOT be used by a push-pull amplifier?

1. A
2. B
3. C
4. AB

1-34. What is the bandwidth of an amplifier?

1. The actual frequencies the amplifier is effective in amplifying
2. The difference between the high and low frequencies seen at the input of the amplifier
3. The width, in inches, between the half-power points on a frequency-response curve
4. The difference between the lowest and highest frequency shown on a frequency-response curve

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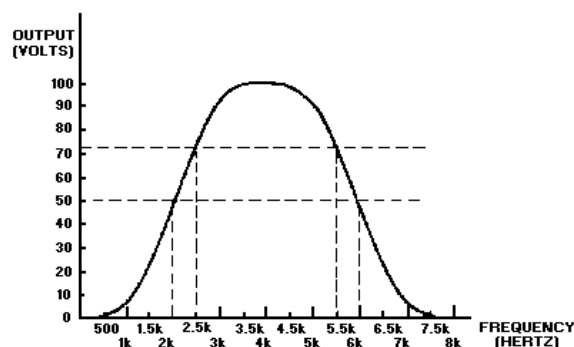


Figure 1A.—Frequency-response curve.

IN ANSWERING QUESTIONS 1-35 AND 1-36 REFER TO FIGURE 1A.

- 1-35. What are the (a) upper and (b) lower frequency limits shown?
1. (a) 8 kHz (b) 0 Hz
 2. (a) 7.5 kHz (b) 0 Hz
 3. (a) 6.0 kHz (b) 2 kHz
 4. (a) 5.5 kHz (b) 2.5 kHz
- 1-36. What is the bandwidth shown?
1. 1 inch
 2. 8 kHz
 3. 3 kHz
 4. 2 kHz to 8 kHz
- 1-37. Which of the following limit(s) the frequency response of a transistor amplifier?
1. The inductance
 2. The transistor
 3. The capacitance
 4. All of the above
- 1-38. What type of feedback is caused by interelectrode capacitance?
1. Bypassed
 2. Negative
 3. Positive
 4. Regenerative
- 1-39. What happens to capacitive reactance as frequency decreases?
1. It increases
 2. It decreases
 3. It remains the same
 4. It cannot be determined
- 1-40. What happens to inductive reactance as frequency increases?
1. It increases
 2. It decreases
 3. It remains the same
 4. It cannot be determined
- 1-41. What is the major factor that limits the high frequency response of an amplifier?
1. Inductance
 2. Resistance
 3. Capacitance
 4. Transformer reactance
- 1-42. What components can be used to increase the high-frequency response of an amplifier?
1. Diodes
 2. Inductors
 3. Resistors
 4. Capacitors
- 1-43. What determines whether a peaking component is considered "series" or "shunt"?
1. The relationship of the component to the power supply
 2. The relationship of the component to the input signal path
 3. The relationship of the component to the amplifying device
 4. The relationship of the component to the output signal path

1-44. What is the arrangement of both "series" and "shunt" peaking components called?

1. Coordinated
2. Combination
3. Combined
4. Complex

1-45. Which of the following components in a transistor amplifier circuit tends to limit the low-frequency response of the amplifier?

1. The transistor
2. The load resistor
3. The coupling capacitor
4. The input-signal-developing resistor

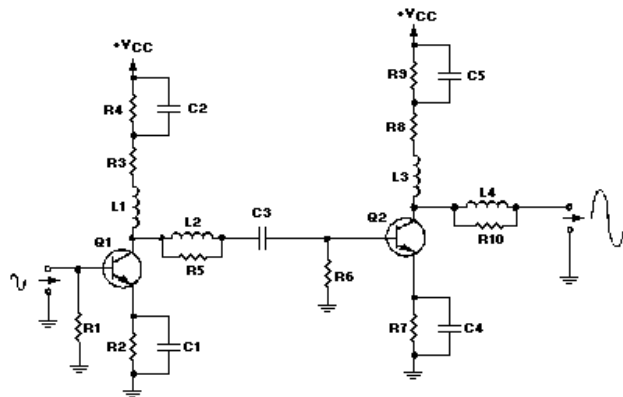


Figure 1B.—Video Amplifier.

IN ANSWERING QUESTIONS 1-46 THROUGH 1-52, REFER TO FIGURE 1B.

1-46. What is the purpose of L1 in relation to Q1?

1. Decoupling
2. Shunt peaking
3. Series peaking
4. Input-signal developing

1-47. What is the purpose of C4 in relation to Q2?

1. Decoupling (Bypass)
2. Shunt peaking
3. Series peaking
4. Input-signal developing

1-48. What is the purpose of R4 in relation to Q1?

1. Coupling resistor
2. Input-signal developing
3. Low-frequency compensation
4. High-frequency compensation

1-49. What is the purpose of L4 in relation to Q2?

1. Coupling
2. Decoupling
3. Shunt peaking
4. Series peaking

1-50. What is the purpose of R10 in relation to Q2?

1. Swamping
2. Input-signal developing
3. Low-frequency compensation
4. High-frequency compensation

1-51. Which of the following components is/are used for high-frequency compensation for Q2?

1. C4
2. L3
3. R9
4. All of the above

1-52. Which of the following components is/are used for low-frequency compensation for Q1?

1. C1
2. C2
3. R3
4. All of the above

1-53. What is the effect of the gain of an amplifier if the input-signal developing impedance is decreased?

1. It decreases
2. It increases
3. It remains the same
4. It cannot be determined

- 1-54. What is the effect on the gain of an amplifier if the output-signal-developing impedance is increased?
1. It decreases
 2. It increases
 3. It remains the same
 4. It cannot be determined
- 1-55. What is/are the purpose(s) of a frequency-determining network in an rf amplifier?
1. To create a large bandpass
 2. To compensate for low-frequency losses
 3. To provide maximum impedance at a given frequency
 4. All of the above
- 1-56. Of the following networks, which could be used as a frequency-determining network for an rf amplifier?
1. A parallel-resistor network
 2. A series-resistor network
 3. A parallel RC network
 4. A parallel LC network
- 1-57. Which of the following methods may be used to tune an LRC frequency-determining network to a different frequency?
1. Vary the capacitance
 2. Vary the inductance
 3. Both 1 and 2 above
 4. Vary the resistance
- 1-58. What is the most common form of coupling for an rf amplifier?
1. RC
 2. Resistor
 3. Impedance
 4. Transformer
- 1-59. Which of the following advantages are provided by transformer coupling?
1. Simpler power supplies can be used
 2. The circuit is not affected by frequency
 3. Low-frequency response is improved
 4. Fewer parts are used
- 1-60. If a current gain is desired, which of the following elements/networks should be used as an output-coupling device?
1. An RC network
 2. A resistive network
 3. A step-up transformer
 4. A step-down transformer
- 1-61. Which of the following techniques would cause a too-narrow bandpass in an rf amplifier?
1. An overcoupled transformer
 2. A loosely coupled transformer
 3. The use of a swamping resistor
 4. The use of a frequency-determining network
- 1-62. Which of the following techniques would cause low gain at the center frequency of an rf amplifier?
1. An overcoupled transformer
 2. A loosely coupled transformer
 3. The use of a swamping resistor
 4. The use of a frequency-determining network
- 1-63. What type of transformer coupling should be used in an rf amplifier?
1. Ideal
 2. Loose
 3. Optimum
 4. Overcoupling

1-64. Which of the following methods provides the widest band-pass in an rf amplifier?

1. A swamping resistor
2. A loosely coupled amplifier
3. A large input-signal-developing resistor
4. A small output-signal-developing resistor

1-65. Which of the following methods will compensate for the problem that cause low gain in an rf amplifier?

1. Using rf transformers
2. Taking advantage of the interelectrode capacitance
3. Both 1 and 2 above
4. Using audio transformers

1-66. Which of the following types of feedback is usually caused by the base-to-collector interelectrode capacitance?

1. Regenerative
2. Decoupled
3. Positive
4. Negative

1-67. In an rf amplifier an unwanted signal is coupled through the base-to-collector interelectrode capacitance. This problem can be solved by providing feedback out of phase with the unwanted signal. What is this technique called?

1. Neutralization
2. Compensating
3. Decoupling
4. Swamping

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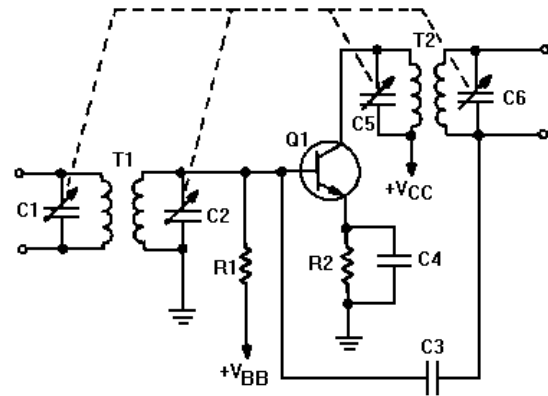


Figure 1C.—RF amplifier.

IN ANSWERING QUESTIONS 1-68
THROUGH 1-75, REFER TO FIGURE 1C.

1-68. Which of the following components is/are part of the input-signal-developing impedance for Q1?

1. C1
2. T1
3. C3
4. All of the above

1-69. What is the purpose of R1?

1. To provide swamping for the secondary of T1
2. To act as an output-signal-developing resistor
3. To provide proper bias to the base of Q1
4. To develop the signal coupled by C3

1-70. What is the purpose of R2?

1. To provide swamping for C4
2. To develop the input signal for Q1
3. To provide bias to the emitter of Q1
4. To act as the output-signal-developing resistor

1-71. If C4 were removed from the circuit, what would happen to the output?

1. It would increase
2. It would decrease
3. It would remain the same
4. It cannot be determined

1-72. Which of the following components is/are part of the load for Q1?

1. C6
2. T2
3. Both 1 and 2 above
4. C3

1-73. How many tuned parallel LC circuits are shown in the schematic?

1. One
2. Two
3. Three
4. Four

1-74. What do the dotted lines connecting C1, C2, C5, and C6 indicate?

1. The components are in a different physical location
2. That the components are "phantom" components
3. The components are variable capacitors
4. The components are ganged together

1-75. What is the purpose of C3?

1. To couple the input signal of Q1 to the secondary of T2
2. To tune the parallel LC circuit of C3, C6, and T2
3. To provide neutralization for Q1
4. To bypass R1